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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/631,956 | 08/01/2003 | David Talkin | 63711-018 | 3672 |

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| EXAMINER | |
|---|---|
| HERNANDEZ, JOSIAH J | |
| ART UNIT | PAPER NUMBER |
| 2609 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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| 3 MONTHS | 01/29/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/631,956 | TALKIN, DAVID | |
| | Examiner | Art Unit | |
| | Josiah Hernandez | 2112 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on *08/01/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-10,18-23,25-27,35 and 36* is/are rejected.

7)☐ Claim(s) *7, 11-17, 24, 28-34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/13/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donovan et al. (US 6,266,637).

As to claims 35 and 36, Donovan discloses a method and a system for smoothing fundamental frequency discontinuities at boundaries of concatenated speech segments (see column 2 lines 8-20, lines 25-39; column 7 paragraph 2). Donovan also teaches that each speech segment is characterized by a frequency contour and 2 or more frames (see column 2 paragraph 1 and column 6 lines 65-70). Donovan further discloses adjusting the fundamental frequency contour of each of the speech segments according to a predetermined function that corresponds to a specific segment (see column 7 paragraph 3 and 4). Donovan does not disclose specifically that the calculated functions are dependent on the length of the speech segments. Although it is not disclosed specifically it would been obvious to someone skilled in the art that if there is

going to be a linear adjustment or slope change to the frequency it would the depend on a rate of change which in turn would depend on either frequency or time. As the speech segments get shorter time and frequency would have less area to be analyzed, therefore minimizing time and space for frequency, which would allow little variance in the rate of change. So the frequency of the longer segments would be adjusted more that the shorter segments. It would have also been obvious to someone skilled in the art that as the speech segments get shorter the discontinuity between the concatenated segments become less noticeable, so the longer segments would be the segments of importance.

3. Claims 1, 4, 5, 8-10, 18, 21, 22, and 25-27 rejected under 35 U.S.C. 103(a) as being unpatentable over Donovan et al. (US 6,950,798) in view of Beutnagel et al (US 6,950,798).

As to claims 1 and 18, Donovan discloses a method and a system for smoothing fundamental frequency discontinuities at boundaries of concatenated speech segments (see column 2 lines 8-20, lines 25-39; column 7 paragraph 2). Donovan also teaches that each speech segment is characterized by a frequency contour and 2 or more frames (see column 2 paragraph 1 and column 6 lines 65-70). Donovan further discloses adjusting the fundamental frequency contour of each of the speech segments according to a predetermined function that corresponds to a specific segment. The parameters that characterize the

function are selected according the beginning and ending fundamental frequency of each segment (see column 7 paragraph 3 and 4). Donovan does not disclose determining a beginning and ending fundamental frequency for each segment. Beutnagel teaches modifying the fundamental frequency of the head and the tail of each segment in respect to that of its adjacent segment (column 5 paragraph 3 and 4). It would have been obvious to have determined the beginning and ending fundamental frequencies of the segments disclosed in Beutnagel in order to smooth the boundary fundamental frequencies from segment to segment as taught by Donovan, because if the mentioned frequencies are not determined it would be impossible to know if the boundary fundamental frequencies need to be adjusted (column 5 paragraph 3 and 4).

As to claims 5 and 22, Donovan does not disclose specifically that the calculated functions are dependent on the length of the speech segments. Although it is not disclosed specifically it would been obvious to someone skilled in the art that if there is going to be a linear adjustment or slope change to the frequency it would the depend on a rate of change which in turn would depend on either frequency or time. As the speech segments get shorter time and frequency would have less area to be analyzed, therefore minimizing time and space for frequency, which would allow little variance in the rate of change. So the frequency of the longer segments would be adjusted more that the shorter segments. It would have also been obvious to someone skilled in the art that as the speech

segments get shorter the discontinuity between the concatenated segments become less noticeable, so the longer segments would be the segments of importance.

As to claims 4 and 21, Donovan does not disclose that the predetermined function includes a linear function. Beutnagel teaches using a linear function to adjust the fundamental frequency contour of each speech segment (see column 5 paragraph 5). It would have been obvious to use a linear function, as disclosed in Beutnagel, to adjust the fundamental frequency taught by Donovan because a linear function is used to adjust the slope or offset of a curve (see column 5 paragraph 5).

As to claims 8 and 25, Donovan discloses smoothing the fundamental frequencies between concatenated boundaries (see column 2 lines 8-20, lines 25-39; column 7 paragraph 2). Donovan does not disclose setting the beginning fundamental frequency value to a fundamental frequency value of the first frame of a segment. Beutnagel teaches examining a set number of frames from a beginning point of each speech segment (see column 5 paragraph 5; column 6 lines 5-15). Then the beginning fundamental frequency of the speech segment is set to the fundamental frequency of the first frame if the fundamental frequencies from the frames fall within a set range (see column 6 paragraph 1; equations 1-3

on column 5). It would have been obvious to use the fundamental frequency of the beginning frame, as disclosed in Beutnagel, to adjust the value of the beginning fundamental frequency of a speech segment taught by Donovan because by doing so, the fundamental frequency contour of the segment will be smooth and will not have any unnatural sounding deviations from the fundamental frequency (see column 5 paragraph 3-7; column 6 paragraph 1).

As to claims 9 and 26, Donovan discloses smoothing the fundamental frequencies between concatenated boundaries (see column 2 lines 8-20, lines 25-39; column 7 paragraph 2). Donovan does not disclose setting the ending fundamental frequency value to a fundamental frequency value of the last frame of a segment. Beutnagel teaches examining a set number of frames from a ending point of each speech segment (see column 5 paragraph 5; column 6 lines 5-15). Then the ending fundamental frequency of the speech segment is set to the fundamental frequency of the last frame if the fundamental frequencies from the frames fall within a set range (see column 6 paragraph 1; equations 1-3 on column 5). It would have been obvious to use the fundamental frequency of the ending frame, as disclosed in Beutnagel, to adjust the value of the ending fundamental frequency of a speech segment taught by Donovan because by doing so, the fundamental frequency contour of the segment will be smooth and

will not have any unnatural sounding deviations from the fundamental frequency (see column 5 paragraph 3-7; column 6 paragraph 1).

As to claims 10 and 27, Donovan discloses smoothing the fundamental frequencies between concatenated boundaries (see column 2 lines 8-20, lines 25-39; column 7 paragraph 2). Donovan does not disclose setting the beginning and ending fundamental frequency value to a fundamental frequency value equal to the median fundamental frequency of a preceding segment. Beutnagel teaches examining a set number of frames throughout each speech segment (see column 5 paragraph 5; column 6 lines 5-15). Then the beginning and ending fundamental frequency of the speech segment is set to a fundamental frequency equal to the median fundamental frequency of a preceding segment (see column 6 paragraph 1; equations 1-3 on column 5). It would have been obvious to use the median fundamental frequency of the preceding segment, as disclosed in Beutnagel, to adjust the value of the beginning and ending fundamental frequency of a speech segment taught by Donovan because by doing so, the fundamental frequency contour from segment to segment will be smooth and will not have any unnatural sounding deviations from the fundamental frequency of a natural voice (see column 5 paragraph 3-7; column 6 paragraph 1).

4. Claims 6 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donovan et al. (US 6,950,798) in view of Stylianou et al. (US 2003/0208355).

As to claims 6 and 23, Donovan discloses smoothing the fundamental frequencies between concatenated boundaries (see column 2 lines 8-20, lines 25-39; column 7 paragraph 2). Donovan does not disclose setting adjusting the fundamental frequencies according to statistical figures. Stylianou teaches determining for each speech segment one or more parameters from a total duration of all segments or from each segment (see [0021]). The parameter can also be selected from the average value of the frequency contour over all voiced regions of the segment. It would have been obvious to use statistical figures, as disclosed in Stylinou, to adjust the fundamental frequencies of the speech segments as taught by Donovan because using statistical analysis allows for accurate frequency adjusting (see [0021], [0025], and [0026]).

5. Claims 2, 3, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Donovan et al. (US 6,950,798) in view of Meron (6,829,581).

As to claims 2 and 19, Donovan does not disclose adjusting specifically the slope associated the fundamental frequencies of each segment. Meron teaches smoothing the fundamental frequencies at the segmental boundaries by adjusting the slope associated with the fundamental frequency (see column 4

lines 35-55). It would have been obvious to have adjusted the slope as disclosed in meron, for smoothing the frequency contour segments taught in Donovan, because changing the slope of the frequency is an easy and effective way to adjust the frequency to match another (see column 6 lines 33-45).

As to claims 3 and 20, Donovan does not disclose adjusting specifically the offset associated the fundamental frequencies of each segment. Meron teaches smoothing the fundamental frequencies at the segmental boundaries by adjusting the offset associated with the fundamental frequency(see column 6 lines 37-40). It would have been obvious to have adjusted the offset, as disclosed in meron, of the fundamental frequency taught by Donovan because changing the offset of the frequency is an easy and effective way to adjust the frequency to match another (see column 6 lines 33-45).

***Allowable Subject Matter***

6. The following is a statement of reasons for the indication of allowable subject matter:

As to claims 7, 11, 24, and 28, there is no prior art reference alone or in combination that teaches or fairly suggests the limitation of setting the median value of a fundamental frequency to the average value of the fundamental

frequency over all voiced regions of the segment as disclosed in claims 7 and 24. As to claims 11 and 28 there is no prior art reference alone or in combination that teaches or fairly suggests the limitation of adjusting the fundamental frequency of a speech segment by applying a ration that is calculated by the beginning and ending fundamental frequencies of two consecutive segments. As to claims 12-17 and 29-34 there is no prior art reference alone or in combination that teaches or fairly suggests the limitation of using a coupled spring model in order to calculate fundamental frequencies that need to be adjusted to obtain smooth segment boundaries.

7. Claims 7,11-17, 24, and 28-34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

## *Conclusion*

Any inquiry concerning this communication should be directed to Josiah Hernandez whose telephone number is 571-270-1646. The examiner can normally be reached from 7:30 pm to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on (571) 272-7761. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

XIAO WU
SUPERVISORY PATENT EXAMINER